

STT Simulator Status 30 March 2001

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- 1 - Emulator tasks
- 2 - Processor (standalone simulator)
- 3 - New simulator (IOGen etc.)

L2STT EMULATOR in Simulator :

- 1- Creates Test Vectors for STC : status: done
 - from SMT, generates data stream as received by STC, for a given Sequencer id and HDI id
 - *from FRC creates list of ALL CFT tracks*

Saves data in a ascii output file
- 2- Creates the simulator output status: to be done
to compare to the STC
output : clusters - centroids – roads (hits-in-roads)
status : to be done

L2STT EMULATOR in Simulator :

3 - Creates LUT for the STC filter: status: part done

- *not activated at present – not used by processor*
- *can create a file for all SMT modules, or for a specific module or a specific set of modules*

This table is used to find the Silicon Chips and Strips which define the edge of the track road for each Barrel and Layer, given the track parameters, CTT Sector, H fiber, pt sign, pt bin and pt ext.

This FilterLUT is foreseen to be implemented in the Roads processor at present in the Simulator :

$$\text{hit_in_road} = \text{road_center} +_ 0.2 \text{ cm}$$

The default mode will be to read LUTFilter from file. The file will be generated only once. (unless changes in geometry ...)

L2STT EMULATOR in Simulator :

4 - Creates LUT for STT hardware address status: to be done

creates correlation from a strip SMT hardware address (or SMT module) and the correspondent hardware location in the STT crates.

See Uli's note

L2STT EMULATOR in Simulator :

- 5- Creates LUT for TFC status: done
 - Creates Silicon hardware coordinate conversion table , by using the standard smt package to handle the translation between hardware and physical address of each strip.
 - Creates CFT hardware coordinate conversion table. (get kappa and phi0).

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L2STT COMPONENTS in Simulator :

status:done

1 – Cluster Algorithm

Encoded the most possibly identical to the VHDL cluster Algorithm in the STC FPGA .

The output of Clusters generated by the simulator will be compared with the output of Clusters generated by the Cluster FPGA in STC

2 - Roads Algorithm

Will need to use the Filter LUT , and then the Hits_in_Road output produced by the simulator will be compared to the Hits_in_Road generated by the Filter FPGA

3 – STT Track Fitter

The code In simulator is already the one that will be downloaded in DSP's DSP's of TFC.

L2STT COMPONENTS in Simulator :

4 – Ntuples

Four Ntuples are produced (separately)

Clusters and Centroids

CFT , Roads and Hits in Roads

STT Tracks

5 – Spy utility.

Allows to study and compare variables from different classes (ie from different Ntuples)

6 – Framework

The simulator has been developed compatibly with the general D0 framework, and as a component of the D0 trigger simulators. As such, it is able to process all MC files generated through D0geant and D0G*.

The framework has lately changed, and new interface has been developed (see next, IOGen section)

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L2STT NEW Simulator :

L2STT Simulator as a component of “tsim_l1l2” (IOGen etc)

Simulator will not be “standalone” anymore in this configuration.

Want to keep the “standalone” active for the moment being, since it needs to be used for emulation tasks. Also, the input files used in the past (typically muon single tracks) will not be readable in the new simulator .

- 1 – IOgen STT inputs “: status: done / not done
 - 1 – SMT_FE : UnpDataChunk at present (was SmtDataChunk)
Can stay as such. Eventually RawDataChunk
 - 2 - FT_L1 ; UnpDataChunk at present. MUST be an IOGen Object,
(from RawDataChunk)
 - new tool became available : “l1l2 unpaker “, by R.Moore -

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L2STT NEW Simulator :

- 2- IOGen Outputs: status : done
STT Track – [Impact parameter, Curvature, Phi0, Chi2, Pt, Rc]

- 3 - STT_Analyze package. status: ~ done / test
new package, going to be used typically as a component of tsim_l1l2.
Creates ntuples (Paw or Root) for the IOGen Objects : STT Track.
- plan to extend IOGen Objects to Clusters and Roads, and to create only one big Ntuple. This will replace the single ntuples in the simulator standalone.

- 4 - Interface to Trigger Menu and Coor .
status : to be done

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L2STT NEW Simulator :

5- general status:

STT “worker” :

the NEW simulator is running successfully (500 Jpsi events) in the tsim_I1I2 frame, when no other “workers” or D0 trigger simulators are added up .

Still need debugging when run together with others (Dugan , Vivek investigating ... crash after 3 events ...)

STT_Analyze :

Compiled and run in CVS t01.36.00. ! That has prematurely disappeared !...Need to rebuild in t01.38.00, to be able to proceed in debugging at run time.

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